



MURI 01

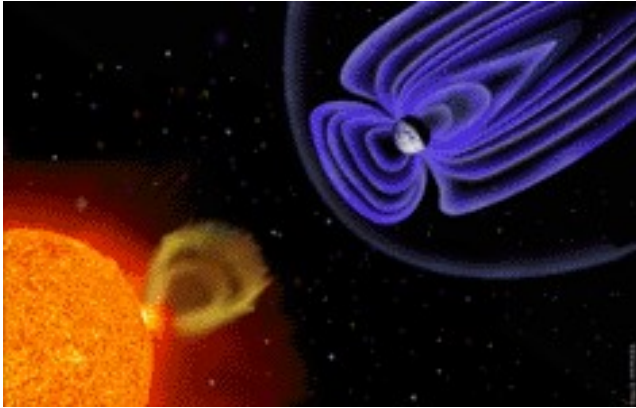
# Understanding Solar Eruptions and Their Interplanetary Consequences

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<http://solarmuri.ssl.berkeley.edu/index.html>



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**Coronal Mass Ejections (CMEs) create geomagnetic storms at Earth, damaging satellites & disrupting C4ISR**

## Approach:

- Measure magnetic fields with high accuracy and coverage to discern the Sun's magnetic properties;
- Construct realistic numerical simulations of solar magnetic phenomena, including interplanetary propagation of CMEs from the Sun to the Earth;
- Couple models of the Sun's lower atmosphere, lower corona, upper corona,

## Objectives:

- Provide warning that a solar magnetic eruption (CME or flare) is imminent and when it will occur;
- Predict whether solar eruptions will propagate to the Earth's space environment;
- Provide accurate forecasts of Solar Energetic Particle (SEP) bombardment,

radiation belt enhancements, and geomagnetic storms.

## Applications:

- Mitigation techniques for spacecraft protection and design parameters for more robust components;
- Operational space weather warnings and forecasts to prepare for communication/navigation outages, power grid disruptions, and spacecraft anomalies;
- Space situational awareness for tactical and strategic planning during military operations.